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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/728,002 | 12/04/2003 | Jae-Yeon Song | 5000-1-519 | 7174 |

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CHA & REITER, LLC
210 ROUTE 4 EAST STE 103
PARAMUS, NJ 07652

EXAMINER

JEAN BART, RALPH

ART UNIT PAPER NUMBER

2613

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/728,002 | Applicant(s) SONG ET AL. | |
| | Examiner Ralph Jean-Bart | Art Unit 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>03/27/2006</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawing Objections

1. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 5, 6, 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 6,804,256) in view of Spinar et al (US 7,006,530).

4. With respect to claim 1, Chang teaches segmenting a single time slot into a plurality of minislots (see figure 12 single time slot frame #1 and minislots which are segmenting into multiple sections such as 1201 to 1205), segmenting a partial

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bandwidth of each of the segmented minislots so as to accommodate the ONUs (see figure 12 ONU #1 to ONU #N, as an example element 1012 is segmenting into a partial bandwidth), and allocating the segmented bandwidths to the ONUs that transmitted the TDMA channel and VOIP channel as voice bands (see also figure 12 voice message TDMA which is referred as elements 1012C and 1012D). Chang fails to teach transmitting a registration request grant message for granting an opportunity for transmitting a registration request signal from the OLT to the ONUs, determining the number of ONUs that transmits registration request messages in response to the registration request grant message.

However, Spinar teaches transmitting a registration request grant message for granting an opportunity for transmitting a registration request signal from the OLT to the ONUs (it should be noted from Spinar's reference the base stations 106 is the OLT and Customer Premise Equipment (CPE) is the OL, see Spinar column 6 lines 30-45; column 11 lines 9-13), determining the number of ONUs that transmits registration request messages in response to the registration request grant message (column 10 lines 3-15 and lines 40-44).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Automatic Bandwidth Adjustment of Chang by incorporating a registration request grant message for granting an opportunity for registration request signal from the OLT to the ONUs in order to provide communication channels on demand between a plurality of user units and one or more associated based station, and, further,

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determining the number of ONUs that transmits registration request messages in response to the registration request grant message which can dynamically and efficiently allocate bandwidth of the media communication system.

The motivation for this modification in Chang is to provide an efficient bandwidth allocation methods which accommodate an arbitrarily large number of users that has uplink bandwidth needs which can be changed over time, and, further to determine the bandwidth needs of users in a timely, accurate, and efficient manner as taught by Spinar (see Spinar column 3 lines 27-32).

5. With respect to claim 2, Chang teaches the voice bands allocated to the ONUs have the same bandwidth (see figure 12 element ONU #2, Voice TDMA 1012C, Voice VOIP 1012D and they are at the same bandwidth which is $M \times 4$ bytes where K is an integer and are used to transfer data packet).

6. With respect to claim 3, all the limitations of this claim have been discussed in claim 1 above; Except dynamically allocating data transmission band to the ONUs that transmits the band allocation request signals by performing scheduling for the bandwidth allocation according to the band allocation request signals transmit by the ONU's on every remaining bandwidth excluding the allocated voice bands from each minislot.

However, Spinar teaches dynamically allocating data transmission band to the Customer premises equipment (CPE) that transmits the band allocation request signals by performing scheduling for the bandwidth allocation according to the band allocation request signals transmit by the CPE's on every remaining bandwidth excluding the

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allocated voice bands from each minislot (see figure 4 sub-frame 400; column 9 lines 33-47; column 10 lines 51-61).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Automatic Bandwidth Adjustment of Chang by incorporating a dynamic allocating data transmission band that transmits a band allocation request signals by performing scheduling for the bandwidth in order to avoid collision and the time delay of the communication system as taught by Spinar (see Spinar column 5 lines 10-15).

7. With respect to claim 5, Chang teaches the time slot has a bandwidth of a maximum of 2 msec (see figure 12, Time interval, $T = M \times 0.5 \text{ mS}$, it is inherent when M is 4, the value of T is 2 mS).

8. With respect to claim 6, Chang teaches the minislot has a bandwidth of a maximum of 0.5 msec (see figure 12 Time interval, $T = M \times 0.5 \text{ mS}$, it is inherent when M is 1, the value of T is 0.5 mS).

9. With respect to claim 7, Chang teaches the single time slot is segmented into a plurality of minislots having the same bandwidth (see figure 12 start frame delimiter 1202, header 1302, ranging time stamp 1204 and churning control 1205).

10. With respect to claim 8, Chang teaches a partial bandwidth of each of the segmented minislots is segmented into a predetermined number of bands, the predetermined number being identical to the number of the ONUs (see figure 12 elements ONU 1012, 2012).

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11. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 6,804,256) in view of Kim et al (Pub. No.:US 2003/0123482).

With respect to claim 3, Chang teaches transmitting a band request grant message for granting an opportunity for transmitting a band allocation request signal for data transmission from the OLT to the ONUs (see abstract), receiving band allocation request signals from the ONUs in response to the band request grant message (see column 16 lines 6-10). Chang fails to teach dynamically allocating data transmission bands to the ONUs that transmitted the band allocation request signals by performing scheduling for bandwidth allocation according to the band allocation request signals transmitted by the ONUs on every remaining bandwidths excluding the allocated voice bands from each minislots.

However, Kim teaches dynamically allocating data transmission bands to the ONUs (see abstract) that transmitted the band allocation request signals by performing scheduling for bandwidth allocation according to the band allocation request signals transmitted by the ONUs on every remaining bandwidths excluding the allocated voice bands from each minislots (see paragraph 0015; figure 5 element 504 step 3 which is similar to the applicant's figure 5 element s180; the Kim reference teaches a PCR which is subtracted from the dynamic bandwidth of the ONU_i).

In addition, regarding claim 4, Kim teaches also dynamically allocating, upon receiving the band allocation request signals from the ONUs, the data transmission bands to the ONUs that transmitted the band allocation request signals by performing

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scheduling for bandwidth allocation on a single time slot excluding the allocated voice bands (see figure 3 element 303).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Automatic Bandwidth Adjustment of Chang by incorporating a dynamic allocating data transmission bands to the ONUs that transmitted the band allocation request signals by performing scheduling for bandwidth allocation according to the band allocation request signals transmitted by the ONUs on every remaining bandwidths excluding the allocated voice bands from each minislots in order to provide a need for a method capable of transmitting information without collision between users and effectively using network resources in the PON system as taught by Kim (see Kim paragraph 0010).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ralph Jean-Bart whose telephone number is (571) 270-1017. The examiner can normally be reached on Monday to Thursday from 8 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye, can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJB
Ralph Jean-Bart

06/29/2006


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER